STUDENTS ATTITUDE TO PRACTICAL LABORATORY WORK PHYSICS IN YOLA NORTH, YOLA SOUTH AND GIREL LOCAL GOVERNMENT AREAS OF ADAMAWA STATE

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Abstract

A survey was carried out to determine students' attitude to practical laboratory work in physics in senior secondary schools in Yola North, Yola South and Girei Local Government Areas of Adamawa state. Twelve senior secondary schools were randomly sampled and 72 students participated in the study. A modified Interest Inventory questionnaire with Cronbach alpha reliability coefficient of 0.86 was used. Two research questions and one hypothesis guided the study. Mean and standard deviation was used to determine students' attitude to practical laboratory work in physics while t-test was used to establish if there was any significant difference between male and female students' attitude to practical laboratory work in physics. The study indicated that the students have negative attitude to practical laboratory work in physics. The study also show that there was no significant difference in male and female students' attitude to practical laboratory work in physics (t = 307, t.erit = 1.658). It was recommended among others that teacher training institutions should reappraise the adequacy of their teacher training programmes so as to equip teachers with competency skills to teach adequately according to the requirements of the physics curriculum.

Since the end of the 19th century, when schools began to teach science systematically, the science laboratory has become a distinctive feature of science teaching. Science educators have stated that many benefits accrue from engaging students in science laboratory activities (Tobin, 1990: Hofstein and Lunette, 2004). Although Hoftein (2004) reported that research has failed to show a simplistic relationship between experiences provided to students in the laboratory and learning science, sufficient data do exist to suggest that laboratory instruction is an effective and efficient teaching medium to attain some of the goals for teaching and learning science.

Appropriate Laboratory activities can be effective in helping students construct their knowledge, develop logical and inquiry-skills, as well as problem-solving abilities. They can also assist in the development of psychomotor skills (manipulative and observational skills). In addition, they have a great potential in promoting positive attitudes and in providing students with opportunities to develop skills in cooperation and communication among students (Tobin, 1990: Gunstone, 1991). In this respect the science laboratory is a unique learning environment as it has the potential to provide science teachers with opportunities so vary their instructional techniques and to avoid monotonous classroom learning situation.

Developing favourable attitudes towards science has often been listed as one of the important goals of science teaching and looking for insights into the situation have attracted a lot of research in recent times. Ivowi (1987) and Ahiakwo (2002) have suggested that the laboratory, as a unique social setting has great potential in enhancing social interactions that can contribute positively to developing attitudes and

cognition in students. Okebukola (1986) revealed that a greater degree of participation in the science laboratory resulted in an improved attitude towards chemistry learning by students in general; and particularly learning in chemistry laboratory. In addition, a comparison of boys and girls reading the various attitudinal dimensions revealed no significant differences. However, a previous study by Walberg, (1967), found that boys' attitude is significantly more positive than that of females in physics. Nevertheless, science education literature continues to emphasize that laboratory work is an important medium for enhancing attitudes, stimulating interest and enjoyment, and motivating students to learn science in general and physics in particular (Freedman, 1997).

Asim, Bassey and Essien (2005) while analysis May/June West African School Certificate results from 1999-2003 reported that an extraordinary good performance of 97.54% was observed in physics in 2000 and drastic drop to 34.46% in 2001, thereafter performance rose to 45.17% and 47.56% in 2002 and 2003 respectively. They observed that the poor performances in Physics still reflect the handicap the nation is confronted with in having adequate number of qualified students pursuing science courses. Considering that this is a physical science considered very difficult, the more students' fail it, the more it will be dreaded.

Physics is an important subject for careers in science and technology. It is required for the study of medicine, engineering, information technology and allied occupations. Substantial research has been done on attitude to science, but few are on individual science subjects (Abiakwo, 2002). Studying student attitudes to practical laboratory work in physics is a contribution towards finding out what is happening in an important science-learning environment (the Laboratory).

Purpose of the Study

The purpose of the study was to determine the attitude of secondary school students to practical laboratory work in physics in Yola North, Yola South and Girei Local Government Areas of Adamawa State. The development of positive attitudes to science is one of the most important goals of science teaching and looking for insight into the situation in our schools especially our laboratories becomes imperative.

Methodology

This study adopted the survey research design. The sample for the study comprised 72 physics students in Yola north, Yola south and Girei Local Government Areas of Adamawa State, the sample was drawn from 12 randomly selected public secondary schools in the three local government &.reas. The instrument used for this study was a modified version of interest inventory in Laboratory practical work in physics developed by Ogunniyi, (1986). The questionnaire was originally comprised of 60 items but for the purpose of this study, it was modified to 24 items. A pre-test was conducted using 20 students from six secondary schools not included in the study. Data collected revealed a Cronbach alpha reliability coefficient of 0.86.

The instrument is structured in 5-point Likert scale response mode indicating the attitude of students to statements on laboratory practical work in physics. The response options were assigned values as follows: 5 (strongly Agree), 4 (Agree), 3 (Undecided). 2 (Disagree), and 1 (strongly Disagree). The Scoring was reversed for negatively stated items.

The upper limit of undecided (3.5) was considered as the cut off mark for agreeing with a statement. The t-test statistics was used to test the hypothesis.

Research Question

Two research questions were used to guide the study:

1. How does physics teachers influence secondary science students' attitude to physics practical laboratory practical work?
2. What is the attitude of secondary school science students to physics laboratory practical work?

Hypothesis

One hypothesis was stated and tested at 0.05 level of significance. 1. There is no significant difference in the attitude of male and female students to physics laboratory practical work.

Results

The overall pattern of students' attitude to practical laboratory work in physics and their gender differences are presented in Tables 1 and 2.

Table 1: Students' Attitude to Physics Practical Laboratory Work.

	Statements	SD	Mean	Remark
1	Laboratory work in physics is boring	1.88	3.14	Negative
2	Performance of experiments in physics Increases my interest in the subject	1.26	3.49	Negative
3.	Much more is learned in students experiments than teacher demonstrations	1.96	3.17	Negative
4.	I am sure I can learn physics	1.20	2.94	Negative
5.	My teachers is interested in my progress in	1.88	2.22	Negative
6.	Mike physics experiments	1.36	2.41	Negative
7.	Physics laboratory work helps me in science	1.86	3.14	Negative
8.	My teacher makes physics laboratory work	1.36	3.05	
9.	I am looking forward to physics laboratory	1.36	.3.02	Negative
10.	We have adequate materials for physics	1.17	3.89	Positive
11.	My knowledge of mathematics helps me in laboratory work	1.71	2.65	Negative
12.	Performing experiments in physics is a waste of	1.14	3.56	Positive
13.	We solve problems in physics laboratory work	1.84	3.42	Negative
14.	My teacher thinks I can do well in physics Work	1.58	3.52	Positive
15	I like reading a good book than doing physics	1.17	3.55	Positive
16	I am sure I can do advance work in physics	.97	2.52	Negative
17	1 like improvising equipments for physics	.11	2.32	Negative
18	I come early for physics practical laboratory	.96	3.52	Positive
19	Physics can be learnt without doing actual	.42	3.12	Negative
20	Physics is important to my future career	.89	3.22	negative
21	Laboratory periods are waste of time	.10	3.60	Positive
22	1 enjoy physics laboratory work	1.87	2.59	Negative
23	I get good grades in Physics experiments	1.45	2.33	Negative
24	More physics laboratories should be built in my school	1.75	2.84	Negative
	Total	**1.55**	**3.05**	**Negative**

To answer research question one item 5 and 8 were used. Result shows physics teachers negatively influence students' attitude to practical laboratory work with a mean of 2.62 and a standard deviation of 1.62. Answer to research question two can also be deduced from table 1 which shows that the students' attitude to physics practical laboratory work was negative with a mean of 3.05 with a standard deviation of 1.55.

The hypothesis was also tested to find out if there is any significant difference in male and female students' attitude to physics practical laboratory work. The result is presented in table 2.

Table 2: Gender Difference in Students' Attitude to Practical Laboratory Work in Physics

GENDER	N	MEAN	STD.DEV.	df	t. cal	t. crit.
Male	51	2.81	14.35			
Female	21	2.79	11.82	71	0.307	1.658**

** Not significant, t. Value 0.307, df. 71, t, crit. 1.658, p>0.05

The table shows no significant difference in the attitude of male and female students' to practical laboratory work in physics (t-value of 0.307, df. 71 and critical table value of 1.658 at alpha 0.05) the null hypothesis was therefore accepted.

Discussion

This study has shown that the students exhibited negative attitudes to practical laboratory work in physics. This could explain students' low enrolment and poor performance in physics in the state. Another possible explanation could be inadequate and inappropriate physics practical laboratory work (Ali, 1986; Eule, 2000) and teachers' resistance to change to new demands of science teaching.

The results also show that there is no significant difference in the attitude of male and female students to practical laboratory work in physics, which corroborated Okebukola's (1986) report. This result is an indication that the students' attitude to practical laboratory work in physics is not gender biased. The result also revealed that teachers influenced students' attitude to practical laboratory work negatively. Teachers have been indicted as contributing negatively to students' attitude to science through poor attitude to work (Sakiyo,
2005).

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